

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
11 August 2005 (11.08.2005)

PCT

(10) International Publication Number
WO 2005/074112 A1

(51) International Patent Classification⁷: **H02M 3/158**

(21) International Application Number:
PCT/IB2004/052900

(22) International Filing Date:
22 December 2004 (22.12.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
04100006.8 5 January 2004 (05.01.2004) EP

(71) Applicant (for DE only): **PHILIPS INTELLECTUAL PROPERTY & STANDARDS GMBH** [DE/DE]; Stein-
damm 94, 20099 Hamburg (DE).

(71) Applicant (for all designated States except DE, US):
KONINKLIJKE PHILIPS ELECTRONICS N. V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **TOLLE, Tobias,**

Georg [DE/DE]; c/o Philips Intellectual Property & Standards GmbH, Weissshausstr. 2, 52066 Aachen (DE).
SLUIJS, Ferdinand, Jacob [NL/DE]; c/o Philips Intellectual Property & Standards GmbH, Weissshausstr. 2, 52066 Aachen (DE). **BÜTHKER, Henrikus, Cornelis, Johannes** [NL/DE]; c/o Philips Intellectual Property & Standards GmbH, Weissshausstr. 2, 52066 Aachen (DE).
WALTHER, Matthias [DE/DE]; c/o Philips Intellectual Property & Standards GmbH, Weissshausstr. 2, 52066 Aachen (DE).

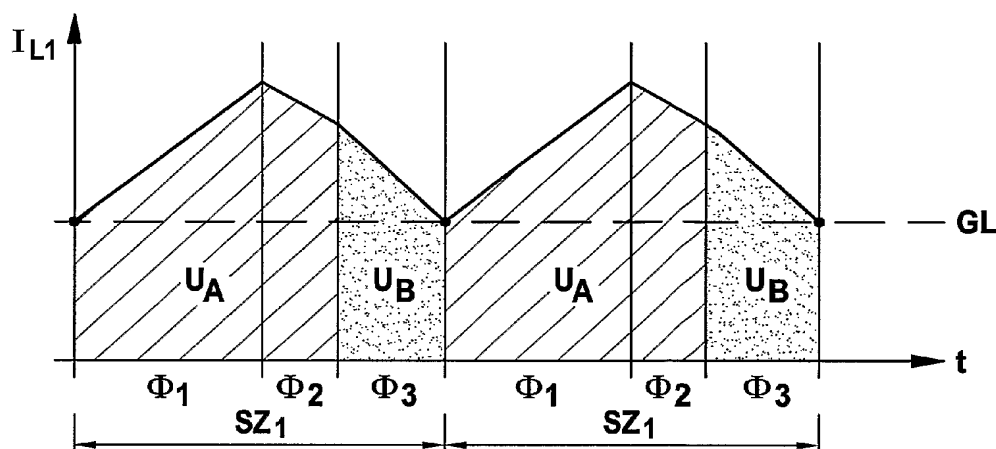
(74) Agents: **MEYER, Michael** et al.; Philips Intellectual Property & Standards GmbH, Weissshausstr. 2, 52066 Aachen (DE).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: METHOD OF OPERATING A DC/DC UP/DOWN CONVERTER



(57) Abstract: A method for an up-down converter which is based on a buck converter during the current down-conversion phase (Φ_2 , Φ_3 and Φ_5 , Φ_6 , respectively) of the coil (L_1) supplies an output (B) with a relatively high output voltage (U_B), where $U_B > U_{in}$. The down-conversion phase of the coil current (I_{L1}) comprises at least two different down-conversion phases (Φ_2 , Φ_3 and Φ_5 , Φ_6 , respectively). A method for an up-down converter, which converter is based on a boost converter, supplies during the current up-conversion phase (Φ_7 , and Φ_{10} , respectively) of the coil (L_2) an output (D) which has a relatively low output voltage (U_D) with power, where $U_D > U_{in}$. The up-conversion phase of the coil current (I_{L2}) comprises at least two different current reduction phases (Φ_7 , Φ_8 and Φ_{10} , Φ_{11} respectively).

WO 2005/074112 A1



GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.